

ON
VARIX
AND
THROMBOSIS



WILLIAM H. BENNETT

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ON
VARIX
ITS CAUSES AND TREATMENT
WITH ESPECIAL REFERENCE TO
THROMBOSIS

AN ADDRESS DELIVERED AT THE INAUGURAL MEETING
OF THE NOTTINGHAM MEDICO-CHIRURGICAL
SOCIETY, SESSION 1898-99

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ON VARIX

MR. PRESIDENT AND GENTLEMEN—The difficulties which present themselves to one called upon to give an address upon an occasion like this are of necessity considerable, not the least being that involved in the choice of a suitable subject. It is my good fortune in the present instance to have been relieved of anxiety in this respect by the kindness of your secretary, Dr. Kingdon, who has been good enough to intimate that some matters relating to varicose veins might form an acceptable topic. For this help I am grateful, not merely because it has relieved me of the responsibility of choosing a subject, but because it enables me to deal with a common and, in the minds of some, I fancy, unimportant surgical complaint to which, if the selection of a subject had been left altogether in my hands, I fear I should have had some hesitation in asking the attention of my present audience. Surgery is now concerned

with so much that is great in conception and performance that there is a danger of the minor and more common matters being somewhat neglected, and, indeed, sometimes of being almost overlooked—a most unfortunate tendency, particularly from the educational standpoint. The observations which I have to make must, I fear, be of the nature of an epitome only, since the time at my disposal will not allow of more than that. I do not know that I have anything actually new to bring forward for consideration ; nevertheless, I venture to hope that the views which I shall express, since they differ to some extent perhaps from those commonly held, may be at least of sufficient interest to justify the trespass I am making upon your time. For sufficient reasons I shall confine myself for the most part to varix of the lower limbs ; I do not propose to weary you with statistics, but I must claim indulgence when, in order to make my position clear, I have to refer to certain elementary details which must be familiar to all.

THE CAUSES OF VARIX

The origin of varicose veins has until comparatively recently been generally considered to be something of a mystery ; speculations as to their causation have from time to time been made, but nothing very definite with regard to the cases commonly met with has been forthcoming.

In some lectures published in 1889 I arrived at certain deductions based upon the consideration of a large number of cases; increased experience during the past ten years has led me to form more positive conclusions than were quite justifiable at the time I have mentioned. A distinguished surgeon, lately deceased, who was himself a sufferer, in the course of a conversation not long ago went so far as to say that he did not believe that anything whatever was known about the origin of varix, and further that very little more was known concerning its proper treatment; and it must be admitted that the information obtainable from the ordinary sources is very meagre. I believe that a little consideration will show that the causes of the disease are not so obscure as to be, at all events in the



FIG. 1.—DANGEROUS REGION OF VARIX. ABNORMALITY TYPE 1: INNER ASPECT.

Varix entirely superficial and limited, connected by communicating branches with the long saphena, which is itself normal. (See page 18.)

majority of cases, insusceptible of explanation. For practical purposes, so far as their causation is concerned, varicose veins may be divided into four classes : (1) those which are congenital ; (2) those due to obstruction of blood-current ; (3) those caused by strain without thrombosis (traumatic) ; and (4) those the result of thrombosis.

1. The CONGENITAL CASES form a large percentage of those usually met with, and consist of two varieties : (a) those connected with the subcutaneous veins only, and (b) those having a direct and gross communication with the deep venous trunks. The second of these varieties is, for reasons presently to be mentioned, by far the more important. As an example of the first variety, the local mass of varix often seen in the calf of the leg may be mentioned, and of the second kind the convoluted collection of varicose veins about the inner side of the knee, which, turning towards the middle of the popliteal region, ends in a large vessel which joins the deep vein directly by passing through the normal opening in the fascia over the popliteal space. A third variety of congenital varix is that in which the whole venous apparatus of a limb is over-developed, with or without corresponding increase in size of the main artery. Such cases vary in degree from what is nothing more than a little exaggeration in the size of the vessels to a morbid condition which may,

without inaccuracy, be termed diffuse nævus. Congenital varix is sometimes very extensive.

A patient who occasionally comes to see me at St. George's Hospital has the most exaggerated varix of all the superficial veins of the right side of the body and right upper and lower extremity with which I have met, some of the vessels on the chest being of enormous size. He is now about forty years of age, very strong, and entirely free, so far as our means of examination allow one to judge, from any visceral abnormality ; there is a large varicocele, but there are no piles. The condition, he is certain, has existed since childhood, and he says that his father was similarly affected.

The congenital cases are, as a rule, not noticed until about or after the time of puberty, when a rapid increase of the abnormality often occurs.

In connection with these congenital cases the question of the influence of heredity naturally arises. So far as I can judge, heredity is a considerable factor (mainly on the father's side), although I am prepared to admit that the decision upon this point must be difficult in a complaint so common. Nevertheless, when it is possible, as is not infrequently the case, to trace the same form of varicosity through successive generations, and in several members of the same family at the same time, it is difficult to conclude otherwise than that in a large number of cases at least heredity is a strong influence.

2. Cases due to OBSTRUCTION OF THE BLOOD-

CURRENT BY EXTERNAL OR INTERNAL PRESSURE. The most familiar examples of this type are afforded by the varix resulting from pressure of the gravid uterus in successive pregnancies in some women, by certain forms of piles, and by the varicosity produced in the veins at a lower level by the pressure of tumours above.

In such cases, if the pressure is sufficiently transient and not too complete, the whole of the dilatation may subside permanently upon the removal of the pressure ; if, however, the tension in the veins is enough to cause the valves when existing to give way, or if, as may happen, aseptic thrombus forms immediately below the seat of pressure, permanent varicosity results.

The gradual increase in varix which occurs after successive

FIG. 2.—DANGEROUS REGION
OF VARIX. ABNORMALITY
TYPE 1: OUTER ASPECT.

Showing mass of varix, having direct communication with the deep veins. (See page 18.)

pregnancies is, I believe, to be explained upon one of these hypotheses, the occurrence of aseptic thrombus being, in my judgment, more common than is generally thought.

3. Cases caused by STRAIN. There is, I believe,



no doubt that, *cæteris paribus*, the veins of persons who when young are subjected to abnormal, and especially sudden, strain, such as may occur in hard 'training,' in gymnastics, particularly the lifting of heavy weights, or in any violent exercise, as, for example, heavy football playing, tend to become varicose more than the veins of persons whose occupations or amusements throw less strain upon the vascular apparatus. The greater the strain in proportion to the strength of the individual the greater will be the tendency to the development of varicosity.

The most exaggerated varicosity arising in this way that I have seen was in an enthusiastic football player in whose ancestors there were no traces whatever of a similar condition; in his case no sign of the defect showed itself until a distinct feeling of something having 'given way' in the thigh had occurred on two or three different occasions, after which first mere enlargement and then tortuosity of the long saphena and its tributaries followed.

After careful observation I have formed the opinion that the immediate cause of the development of varicosity in cases of this kind is the giving way of the vein valves, usually the proximal pair, which under conditions of great general tension naturally have to bear the greatest pressure, although they are not infrequently imperfect anatomically. To produce proof of this contention is necessarily difficult,

but the evidence of a case like the following is undeniable.

A young man, aged eighteen years, of strong physique and in perfect health, whilst doing some heavy gymnastic work felt something 'give way' in the upper part of the right thigh. No discomfort worth mentioning followed, but as he felt some weakness about the part he consulted me three weeks afterwards. Upon examination the saphena from the groin to a point just above the knee was at least twice the size of the vein below that point, which was apparently natural; the enlargement above ceased abruptly at the point named. The veins in the opposite limb were natural. There could be no doubt that the proximal saphenous valves had become incompetent by reason of the strain, and that the vessel had become enlarged in consequence down to the next competent valves. Circumstances, apparently unavoidable, made it necessary for the violent exercise to be continued, and a second strain was distinctly felt a fortnight after I saw the patient. A month after the second strain the whole saphena from the groin to the ankle was very large, later it became tortuous, assuming all the characters of ordinary varix.¹

I have seen other cases of the same kind. In one of these I removed a considerable length of the saphena, which was as large as my index finger; the valves, of which there were three pairs in the portion removed, were incompetent, and one flap had been apparently torn almost off the vein wall, so that it must have been floating nearly free in the

¹ For examples of similar cases occurring in the upper extremity see *Lancet*, May 5, 1894.

blood-stream. In connection with this last remark it is noteworthy that in some cases of varix arising in this way from sudden strain *a soft bruit* is perceptible upon auscultation, although no pressure of any kind is made upon the vein ; indeed, it may be possible to hear the bruit by placing the stethoscope on a limb a short distance from the affected vessel. Included in the category of varix arising from strain are those cases of varicose veins in the lower limbs occurring in persons whose occupations entail long-continued standing without much variation in position—girls and young men serving in shops, for example. In these cases the strain is, of course, very slight, but it is so continuously applied by the long column of blood in the saphena that the ultimate effect is to produce varicosity of various degrees in different subjects. There is, however, sufficient reason for believing that varix of this kind occurs only in subjects whose veins are in some way defective, congenitally, from previous traumatism, or from pathological change.

Some years ago I had an opportunity of ascertaining the condition in relation to varix of the lower limbs in a number of persons selected at random who were employed in a large business house. Fifteen per cent. were grossly affected, and of these nearly half were very robust ; on the other hand, amongst those free from the defect were some of the most anaemic

and delicate-looking of the number examined. Bearing in mind that the occupation of all these subjects was identical, and that the defect was not confined to the weak but occurred with apparent indifference in

the strong and weakly, it must, I submit, be conceded that there is here strong presumptive evidence in cases of this kind that the origin of the disease lies in some inherent defect in the veins themselves. The fact that the condition when once started tends to become more exaggerated in weakly subjects in no sense affects the validity of this contention.



FIG. 3.—DANGEROUS REGION OF VARIX. ABNORMALITY TYPE 2.

Mass of varix at the inner side of knee, quite superficial, attached above to the saphena, which it overlies and conceals. The saphena itself is uninvolved. (See page 19.)

4. THROMBOSIS as a cause of varix. The effect of thrombosis of the large venous trunks—such, for example, as the iliac vein or inferior vena cava—

especially as a complication of enteric fever, in the production of general varicosity of the limb below is

too familiar to call for comment. The importance, however, of thrombosis as a factor in the causation of a certain type of varicosity in the leg is not, I venture to think, commonly recognised, nor am I aware of any mention of the matter in surgical literature. Strains and other similar injuries of the leg or ankle followed by pain and acute tenderness down the middle of the calf, sometimes insufficient to cause more than momentary or very transient trouble, but at times enough to render the limb practically useless for a considerable period, are not infrequently followed very soon by dilatation of the saphena veins, which, if more than very temporary, passes onwards to tortuosity, with the development of characteristic varix which rarely extends above the knee, terminating generally at the point at which the great saphena of the thigh is completed by the junction of the two trunks at the upper end of the leg. The cause of this development is thrombosis of the main deep veins—i.e. the *venæ comites* of the posterior tibial artery, &c. The primary saphenal dilatation is merely the result of the establishment of the collateral circulation. If the thrombus clears up or if the unaffected deep veins take up the collateral function this dilatation is temporary only and soon disappears; if, on the other hand, as not infrequently happens, the thrombus leads to occlusion of the deep channels, the superficial dilatation remains perma-

nently, and sooner or later a state of ordinary acquired varicosity of the leg follows, which extends, as a rule, no higher than the junction of the two branches already mentioned which complete the formation of the femoral saphena, as at this point the blood-current becomes so free that no appreciable change is produced higher up. The clinical importance of these cases is considerable, and lies rather in the history of the cases than in the local symptoms. A proper appreciation of the condition is essential in relation to treatment, as I shall presently show.

A characteristic case of this kind is the following :

A man, aged thirty-six years, whilst walking slipped off the kerb and ‘sprained his ankle’ ; he paid no attention to the injury at the time. On the following morning on attempting to leave his bed he felt so much pain in the calf of the leg that he could not do so. I saw him a day later—i.e. about forty-eight hours after the accident ; he was then suffering acute pain on the least movement in the middle of the calf ; there was tenderness as well as other unmistakable symptoms of deep thrombosis. Just behind and below the internal malleolus there was slight puffiness ; over this area some bruising appeared a few days later. In three weeks he was well enough to get about, but the superficial veins of the leg were full and considerably larger than those on the opposite side. I saw nothing more of the patient for two years, when he again came to see me, giving the following account of himself. Although he had apparently recovered from the injury and could do practically anything he desired in the way of exercise, he had experienced at times after

a heavy day's work a feeling of fatigue in the affected leg, and a year before seeing me he observed that the veins about the leg were much swollen. By degrees this swelling increased until it became so marked that he felt bound to seek advice. Upon examination I found well-marked varicose veins of the leg of the kind I have mentioned, and about the inner ankle was a pad of small dilated vessels. The whole leg was slightly larger than its fellow, but there was no tenderness, œdema, or other unnatural manifestation. The thigh was precisely as that of the opposite side.

In the course of some investigations as to the condition of the deep veins on the cadaver in persons who showed obvious signs of varicose veins in the leg I found in two cases the venæ comites of the posterior tibial artery completely occluded by organised thrombus. At the time (now some ten years ago) I attached no importance to the condition, but in the light of subsequent clinical experience it is of distinct significance in relation to the point I am discussing.

In young adults a peculiar hardening of the subcutaneous veins is sometimes met with, especially about the leg and ankle, the vessels being cord-like in feel and often tender. The hardness generally disappears temporarily upon the application of heat—as, for example, by the pressure of a sponge soaked in hot water. I have seen this condition, which may be mistaken for thrombosis, followed in four instances by the rapid development of varix, but whether there

is any real relation, as cause and effect, between the two conditions, I have no evidence to show. The hardness in the veins referred to appears to be due to a general thickening of the muscular wall of the vessel, the cause of which is not plain.¹

THROMBOSIS AS A COMPLICATION IN VARIX

It is commonly stated that varicose veins of the lower limbs are not in any way dangerous to life, although they may be productive of discomforts and complications sufficiently serious to incapacitate a patient from following any active employment. Speaking generally this statement is without doubt true, but there are exceptions to it of enough importance to make the matter worthy of some consideration. There are certain well-defined types of varicosity which afford an ever-present source of danger, which, if the condition be recognised, is easily obviated by the removal by operation of the veins concerned.

That the existence of this danger is not realised by some people is abundantly clear from the obstacles which even now are often thrown in the way of operations which, being practically devoid of risk, are suggested as a preventive measure before local changes have occurred which rapidly tend to disastrous results. In the course of a comparatively short

¹ Attention has also been called to this condition by Dr. F. Parkes Weber. (Pathological Society, May 17, 1898.)

time I have seen one case in which life was sacrificed, and seven others in which it was placed in jeopardy, by the failure to recognise the importance of certain conditions to which I shall presently refer. For practical purposes the only immediate dangers to life arising from varicose veins are : (1) the occurrence of profuse bleeding from the 'bursting' of a thinned vein; and (2) the formation of thrombus which may either rapidly extend to the great venous channels or lead to the detachment of emboli, which if large enough may cause immediate death, or if they pass through the heart lodge in the lungs, giving rise to pulmonary lesions which are sometimes fatal.

It is, I believe I am right in saying, a rather common belief—which is in a general way justifiable—that thrombosis of a vein which is varicose is of less importance than of a vein which is normal, since



FIG. 4.—DANGEROUS REGION OF VARIX. ABNORMALITY TYPE 3.

Superficial venous eysts connected with each other by tortuous and dilated veins overlying the saphena at inner side of knee. The saphena itself is normal. (See page 19.)

in the former condition extension of the clot or its disturbance is less likely to happen. Indeed, it is a common experience to find patients allowed to get about and follow their ordinary vocations with comparatively recent clots in varicose veins of the leg, which if they existed in veins which were not varicose would inevitably lead to the prescription of long-continued complete rest. There is no doubt that so far as the limb below the knee is concerned, in the absence of very gross neglect, results serious to life rarely follow immediately from thrombus in varix. In the thigh and at the knee, however, the matter is altogether different, since a recent clot in varicose veins in those regions is always a serious and sometimes a fatal lesion ; in certain types of varix the gravity of thrombus cannot be overestimated.

The local conditions predisposing to thrombosis in varix are—(a) cysts or acute bends in greatly dilated vessels ; (b) peculiarity of situation with regard to mobility ; and (c) liability to injury. Thrombus in varix almost invariably begins either in cysts, cystic dilatations,¹ or in the acute bends of very tortuous and greatly dilated vessels. In situations in which the affected veins, especially if very large, are continually subject to movement—e.g. alternate bending and straightening—thrombus is especially prone to form. The effect of trau-

¹ See *Lancet*, April 12, 1890.

matism as a cause of thrombosis is too familiar to require comment. The tendency of thrombosis in varix to spread and invade the great deep venous channels increases with the size of the vein, the absence or inadequacy of the vein valves, and especially with the existence of a gross lateral communication between the part in which the clotting occurs and the main deep venous channel nearest in relation to it. The liability to embolism will of necessity be increased by the same conditions; *upon these conditions, therefore, may be said to depend the gravity of thrombosis in varix.* Of the constitutional states predisposing to thrombosis it is unnecessary to speak; they act in the same way, but with more force, in varix as they do under normal local conditions.

THE DANGEROUS REGION IN VARIX

If a portion of the inner half of the circumference of the lower limb be marked off by two transverse lines, one about the middle of the thigh and another three inches below the line of the knee-joint —i.e. at the point where the two main subcutaneous veins of the inner side of the leg join to form the main femoral trunk of the internal saphena—an area will be included in which the local conditions predisposing to thrombosis in varix are present in a

remarkable degree; indeed, for practical purposes they may be said to be limited to that area. Cysts, often of great size, are there common; huge dilated tortuous vessels, valveless and with abrupt bends, are frequent, and are constantly being subjected to the straining movements produced by flexion and extension at the knee. The special liability to injury of the affected vessels about the inner side of the thigh and knee in riding and numberless other amusements and occupations is obvious. So far as my experience goes all cases of thrombosis in varix of a grave nature, apart of course from those dependent upon acute inflammation or other septic conditions about the limb, with hardly any exceptions, originate within the limits of the area described. I have therefore been in the habit of designating it the ‘dangerous region of varix,’ employing the term ‘dangerous’ to imply risk either to life or to the integrity of the limb.

In order that the importance of the dangerous region may be fully understood, it is necessary to indicate the several varieties of varix which are found within its limits. Excluding slight tortuosities of unimportant venous radicles, there are eight distinct varieties of varix met with in this region; all are either connected with or actually involve the long saphena.

Type 1. An extensive arrangement of tortuous

and dilated veins, containing many small cystic dilatations, which commences at the outer side of the knee and, running upwards and inwards just above the patella, joins the saphena a little below the middle of the thigh. This varix is often joined at its commencement, where there is also sometimes a deep branch connecting it with the deep veins, by an afferent tortuous vessel proceeding across the front of the leg or knee from the saphena below or opposite the latter point (figs. 1 and 2).

Type 2. A large mass of varix above and to the inner side of the knee, sometimes extending down into the upper part of the leg; the mass is quite superficial, attached above to the saphena, upon which it lies and conceals. It has running into its lower end large superficial varicose veins, beneath which the saphena of about the normal size can usually be seen to run (fig. 3).

Type 3. Two, three, or more distinct venous cysts, varying in size from that of a horsebean to a large cherry, connected to one another by tortuous and dilated veins. This arrangement generally extends from a little below the middle of the thigh and reaches to the level of or below the line of the knee-joint; it is quite superficial, overlying the saphena, to which it is attached above; below it receives varicose veins from the leg (fig. 4).

Type 4. A mass of varicose veins turning round

the inner side of the knee, connected with the saphena either above or below and ending nearly always by

direct communication over the middle of the popliteal space, either with the popliteal vein itself or with the short saphena immediately before it joins the deep vessel (fig. 5).

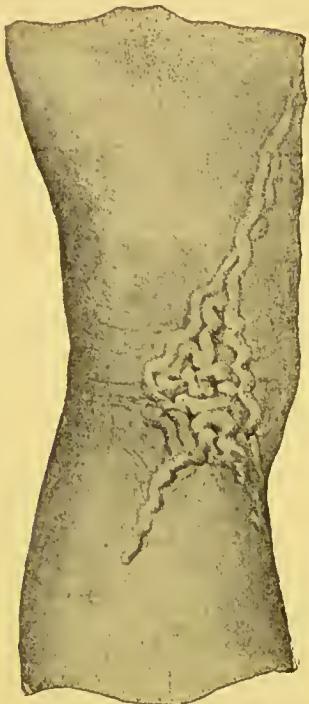
In these four types the saphena, although it may in exceptional cases be large and tortuous, is as a rule normal.

Type 5. A similar condition to that described in Type 2, but as a rule smaller. It terminates above in a considerable cystic dilatation of the saphena just below the middle of the thigh, and receives below varicose veins from the leg. The saphena itself, large and sometimes tortuous, runs beneath the superficial varicose mass, and often presents a second cystic dilatation just below the

FIG. 5.—DANGEROUS REGION OF VARIX. ABS. NORMALITY TYPE 4.

Mass of varicose veins over popliteal space, connected with the saphena above and below, turning round inner side of knee to terminate over middle of popliteal region by direct communication with the deep veins. The saphena itself is normal. (See page 19.)

knee. The valves of the saphena are inadequate, and there is sometimes a varix at the saphenous opening (fig. 6).



Type 6. The saphena is very large throughout, its diameter being sometimes three-quarters of an inch. From the middle of the thigh to below the knee it is extremely tortuous, the bends of the tortuosities being often very abrupt. The valves are non-existent and a varix at the saphenous opening is common (fig. 7).

Type 7. A single large cyst of the saphena situated immediately below the middle of the thigh or just above the knee, of a size varying from a cherry to that of a pigeon's egg. The saphena itself is moderately dilated throughout, and may be slightly tortuous at the inner side of the knee. As a rule, however, the cyst is the only abnormality *visible* in the thigh, although in the leg the radicles of the saphena are varicose, sometimes to an extreme degree. The saphenal valves are entirely inadequate, and when the cyst is situated low down it not uncommonly communicates with the femoral or popliteal trunk by means of an ascending or descending branch of large size (fig. 8).

Type 8. Two large cysts of the saphena, one situated below the middle of the thigh, the other opposite or a little below the knee. The saphena is much dilated, and between the cysts tortuous, standing out prominently. The lower of the two cysts often communicates with the femoral or popliteal trunk. There is almost always a varix at the saphenous

opening and the saphenous valves are virtually wanting. The veins of the leg are varicose generally to a considerable degree (fig. 9).

It will thus be seen that these eight variations embrace three distinct classes of venous abnormality —one in which the varix is local and limited, the saphena being for practical purposes normal; a second in which the saphena is largely if not solely affected, its valves being wanting or inefficient; and a third class, in some respects the most important, in which direct lateral communication exists between some portion of the abnormal veins and the nearest deep venous channel—i.e. the femoral or popliteal vein, as the case may be.

I have already explained the reasons for the proneness to thrombosis which each of the varieties of abnormality mentioned undoubtedly shows. In the cases in which the saphena is normal and no other gross communication with the deep veins exists the varicose mass is so isolated that there are, if ordinary care be observed in treatment, no serious grounds for fearing that extension of clot to the great vessels will take place. In the cases, however, where the saphena is seriously involved, its valves being virtually non-existent, and in the cases associated with a direct lateral communication between the varix and the nearest deep venous trunk, the rapidity with which thrombus invades the deep channels is

remarkable and sometimes appalling. I may perhaps say here, in parenthesis, that the extension of a thrombus in a vein is not checked only by the nearest collateral branch, as would be inferred from the teaching of the books, but also by the vein-valves provided that they are perfect—a fact which, although I believe it is not commonly recognised, can be easily verified by any intelligent person who will watch the progress of a thrombus creeping along the length of an anatomically normal saphena vein. The rapidity with which a greatly enlarged valveless saphena will fill with clot from the knee to the groin is very extraordinary. The existence of a distinct sacculation on a vein, although primarily conducive to clotting, is up to a certain point antagonistic to the spreading of the clot, since this tends at first to confine itself to the sacculation; but the usual methods of treatment are not such as to take advantage of this help, and the thrombus therefore frequently extends into the vein and grows up its channel in the ordinary manner. A characteristic example of cyst thrombus, showing the disastrous results which may follow inadequate treatment, is afforded by the following case :

A woman, aged thirty years, a cook, unmarried, was sent to me at St. George's Hospital on account of varix of the lower limb. Upon examination there was found to be a large saphenal sacculation a little below the

middle of the thigh, the saphena itself being very large throughout. I advised removal of the cyst and adjacent portions of the saphena in consequence of the risk of thrombosis entailed by her occupation. Her own disinclination and the advice of others led to the operation being declined. Three months later she was admitted with thrombosis entirely limited to the cyst, the saphena being quite soft and free from clot. Feeling certain that sooner or later the clot would invade the saphena and travel to the deep veins, I urged either the removal of the cyst with its contained clot or ligature of the healthy saphena above to prevent the upward progress of the thrombus. Again the operation was declined. Treatment by the usual methods was therefore carefully carried out. On the fourth day after admission the saphena became almost suddenly filled with clot from the cyst to the groin, and blocking of the femoral and iliac veins followed immediately. She subsequently died from septic pneumonia, the result of three successive embolic infarcts.

I presume there can be no reason for doubting that if I had been allowed to operate whilst the thrombus was confined to the cyst the life of this patient would have been saved. Although this may possibly be regarded as an extreme case it is not the only one of the kind which I have known to end fatally. Of similar cases in which permanent crippling of the limb has resulted from the invasion of the deep veins by thrombus in consequence of the importance of energetic treatment not being realised I could give many examples.

Of the gravity of the lateral communication between the varix and the nearest deep venous channel I have had considerable clinical experience ; the following is a good illustration :

A healthy young woman consulted me with reference to varicose veins behind the knee. She was an energetic horsewoman, and she was induced to seek advice because at the end of a day's hunting the mass of veins became full and sensitive in consequence of the pressure of the pommel of the saddle. Upon examination there was well-marked varix of the kind indicated in Type 4 ; it occupied the inner side of the popliteal space, and obviously dipped down as a large branch to end in the popliteal vein or the extreme end of the short saphena. I strongly urged removal of the varix, because I felt sure that unless riding was given up thrombus of the varix would occur some day, a crippled limb and possibly risk to life probably following in consequence of the invasion of the popliteal and femoral veins by the clot. Operation being at the time inconvenient to the patient, it was postponed to a future date. About three months later thrombus of the varix occurred in the way I had anticipated, the femoral vein becoming very quickly involved ; the saphena remained quite healthy and free from clot. The patient progressed in the ordinary way with rest, but the limb has never recovered its normal condition. It is larger than its fellow, and becomes oedematous towards the latter end of the day ; the saphena has become dilated and tortuous.

It is quite clear that the extension to the deep veins in this case took place through the immediate

communication with those vessels and not through the saphena; it is, I think, equally certain that had the treatment I recommended been carried out the crippling of the limb would have been avoided. This particular type of varix may be regarded as especially important in horsewomen. I have no knowledge of



FIG. 6.—DANGEROUS REGION OF VARIX. ABNORMALITY TYPE 5.

Similar condition to that seen in Type 2, but smaller, and terminating above in cystic dilatation of saphena. The saphena itself, large and sometimes tortuous, runs beneath the superficial mass, and generally presents a second cystic dilatation below the knee. (The second cystic dilatation, which should be seen at the extreme lower margin of the figure, did not come out distinctly in the original photograph.) (See page 20.)

any fatal case, but I could quote other instances in which permanent crippling has occurred in the manner described.

The crampy pains not uncommonly associated with varix of the legs, especially in persons of middle age, are, I believe, due to thrombus of the intramuscular

veins. I called attention to this point in a lecture published in January last.¹ These crampy pains are acute and transient, but they often leave a sense of stiffness about the part, over which there is usually slight tenderness, occasionally followed by local spots of discolouration; they are therefore easily distinguished from ordinary cramp. The occurrence of these pains is a sure indication of coming increase in the varicosity, and has a definite bearing upon treatment.

THE SPONTANEOUS DISAPPEARANCE OF VARIX

At present I have spoken of thrombosis in varix as a harmful factor only, which, as a rule, it undoubtedly is, the degree of mischief occasioned by it varying from temporary inconvenience to a fatal lesion. Sometimes, however, a thrombus exercises a beneficial influence which is deserving of recognition, since it leads at times to what may in a sense be termed spontaneous cure. For the attainment of this desirable end organisation of the thrombus with complete occlusion of a considerable length of the affected vessel is essential.

Few things are more remarkable than the changes which constantly take place in the varicose veins in the legs of old people, in whom passive thrombus is of frequent occurrence and generally gives rise to so

¹ *Clinical Journal*, January 19, 1898.

little discomfort when confined to unimportant vessels that it barely attracts notice. A careful examination of varicose veins in such subjects will often reveal the existence of innumerable obliterated venous areas (with or without phleboliths) which are the outcome of thrombosis. In a person of any age the effect upon a varicose limb below the knee of a thrombus of the saphena which ends in organisation and occlusion of the vessel is remarkable, being in fact the same up to a certain point as that which follows the removal of a portion of the saphena by operation. Unfortunately, in varix of the saphena organisation of thrombus is the rare exception, softening being the rule.

The most complete example of spontaneous cure of varix by thrombus is seen in varicocele, in which occasionally a cure as perfect as can be effected by the most radical operation will follow thrombosis, which is commonly traumatic in origin, but may in gouty subjects be spontaneous. Extensive thrombosis in varicocele is more common than is generally supposed ; sometimes the condition is, I fancy, not recognised when it does occur. I have myself seen a case in which a diagnosis of gouty orchitis had been made in consequence of some effusion in the tunica vaginalis, the result of thrombosis of the spermatic plexus of veins. The most striking case of spontaneous cure of varix following upon thrombosis with which I have met is the following :

A man, aged twenty-seven years, came to St. George's Hospital for advice concerning a varicocele which had begun to give discomfort after he had been lifting heavy weights. There was a large varicocele, which I caused to be photographed, as it illustrated a point in which I was interested; it was arranged that the patient should be admitted into the hospital for operation at a later date. Three weeks after I saw him he returned, his varicocele having been struck by a heavy box which slipped as he was lifting it. The left side of the scrotum was bruised, and a sausage-shaped, slightly tender, and somewhat boggy swelling, extending from the groin to the testicle, occupied the place of the varicocele; the testicle was unaffected, but there was a little fluid in the tunica vaginalis. He was prevented for reasons which were to him sufficient from coming into the hospital for treatment, and I saw nothing more of the man until a year later, when he came for advice because he thought his left testicle was dwindling away. Upon examination the testicle was certainly smaller and softer than that on the opposite side, although at first sight it seemed of the same size, as there was some slight effusion into the tunica vaginalis. The varicocele had entirely disappeared; just above the testicle was an elongated hard mass of the size and shape of a date-stone. There was neither pain, tenderness, nor discomfort of any kind. He stated that the swelling resulting from the injury had gradually disappeared after he had laid up for a fortnight, and that since its disappearance he had suffered no inconvenience whatever, although he had been doing his ordinary heavy work (figs. 10 and 11).

I have memoranda of five other cases (one in a medical man) of spontaneous cure of varicocele

following upon thrombosis, in three the result of traumatism, and in the remaining two apparently spontaneous in gouty subjects. In the case described above there was certainly some testicular wasting in the true sense, and in one of the gouty cases the testicle atrophied to an extreme degree, nothing remaining beyond an insensitive nodule. I have no knowledge of any mention elsewhere of the spontaneous cure of varix in this way.



FIG. 7.—DANGEROUS REGION OF VARIX. ABNORMALITY TYPE 6.

Saphena very large throughout, and extremely tortuous about the inner side of the knee; valves non-existent; large varix at saphenous opening. (See page 21.)

It is sometimes stated that varicocele disappears in old age, and I have been assured that this is the case by a surgeon of great experience, who tells me he has never seen a varicocele in an old man.

This is entirely opposed to my own experience, for

I have seen varicocele in old people not very rarely ; an old gentleman, for example, of whom I had seen much for many years, who recently died at a great age, had a very large varicocele for which he wore a support to the day of his death. At the same time it must be admitted that varicocele does at times undergo changes which tend to great diminution in size upon the decadence of testicular function, but I am strongly inclined to the belief that the changes which lead to *complete disappearance* of varicocele in old age are due to passive thrombosis of the spermatic veins, a view which receives some support from the frequency with which phleboliths and local occlusions are found in the veins of the spermatic cord in persons advanced in years.

THE PALLIATIVE TREATMENT OF VARIX

The remarks I have to make upon the palliative treatment of varix are, I fear, rather elementary, but they will not detain you long. In the early stage of the complaint, especially if there be a tendency to œdema, the results of massage properly applied are beneficial often to a remarkable degree ; in its employment some discrimination is requisite. It is to be avoided in cases in which obvious cystic dilatations are present, and when any indications of recent thrombosis are manifest ; it is therefore, for example,

inapplicable during the occurrence of the crampy pains to which I have referred.

Moderate exercise in the absence of recent thrombosis is in all cases good; excessive exercise or overstrain is necessarily bad; worst of all is standing for a long time in the same position.

In all cases rest in the recumbent position with the legs raised for an hour or so in the afternoon of each day is advantageous if practicable. Electricity in addition to massage is said by some to effect great results; personally I have seen no permanent good in excess of that obtainable by massage alone come of the combined method.

There is probably hardly anything which produces so much harm in varix as the routine use of elastic support, whether this takes the form of stockings or of bandages. I believe I am right in saying that 25 per cent. of the cases of varix in which real trouble arises are due to the use of elastic and other supports which are either unnecessary or ill-fitting. In individuals following ordinary occupations varix which causes no trouble and shows no tendency to increase should be left alone, unless, for reasons presently to be mentioned, operation is indicated. At first sight it may appear that an elastic support, if it is not actually necessary, can at all events do no harm. Nothing, however, is farther from the fact than this assumption.

That varix is often discovered quite accidentally is a matter of common knowledge, and the discovery, unless ignored altogether by the patient, is generally followed by the wearing of an elastic support of some kind, often with the worst result possible.

It is not uncommon in my experience to find people who have been the subject of varicose veins in the lower limbs for years which have never given trouble of any kind begin to complain of discomfort, and perhaps increase in the condition, not long after having taken to the use of elastic stockings recommended casually by some friend. These stockings are frequently obtained after a rough-and-ready measurement from a druggist, co-operative stores, or wholesale house, where they are kept in ‘stock’ sizes; hence they rarely if ever fit, and the almost inevitable result of the wearing of an ill-fitting stocking in varix is an increase in the disease or the occurrence of some undesirable complication. It is essential if an elastic stocking be used that it should fit perfectly, and it is, so far as I can judge, one of the most difficult of appliances to obtain perfect.

In varix confined to the leg the harm done by ill-fitting supports or badly applied bandages is less than in varix affecting the thigh. I have seen four cases of grave thrombosis in the thigh undoubtedly caused directly by ill-fitting appliances. I therefore never allow a patient suffering from uncomplicated

varix of the thigh to use any support above the knee, not only because serious complications are sometimes so caused, but also because all the comfort obtainable in uncomplicated varix of the lower limb can be afforded by a properly arranged support which does not extend beyond the upper limit of the leg. In certain cases of œdema of the whole lower limb elastic support throughout may be indicated; in such circumstances the thigh piece of the support should invariably be made distinct from that of the leg, the two parts should never be continuous.



FIG. 8.—DANGEROUS REGION OF VARIX. ABNORMALITY TYPE 7.

Single large cyst of the saphena situated in lowest third of thigh. The saphena itself somewhat dilated throughout, but not as a rule visible in thigh. Leg generally very varicose. (See page 21.)

considerable percentage of the cases coming under observation in which the vessels are abnormal only inasmuch as they are large and somewhat tortuous,

In passing I must here mention that there is a well-marked type of varix met with in a con-

the valves being natural and their functional properties perfect. This is especially the condition found in the varix of the lower limbs which is often accidentally discovered either soon after puberty or at about the age of twenty or twenty-one years. In some of these cases the main artery of the limb is abnormally large. It is, in the absence of symptoms pointing to its desirability, as unreasonable in a case of this sort to use an artificial support as it would be to do so in a normal limb.

Varix of the leg arising from deep thrombosis after injury in the manner already indicated requires gentle elastic support from the beginning, with intelligent massage as soon as any tenderness has disappeared; by these means a cure in the true sense can often be effected, the use of the elastic support being generally necessary for about twelve months, after which it may be discontinued.

THE OPERATIVE TREATMENT OF VARIX

The operative treatment of varix has now been freely practised sufficiently long to enable a proper estimate of its value to be made. It is a treatment with very distinct limitations in its scope and application, more discrimination being required in its successful employment than is, I venture to think, commonly supposed.

There are few treatments which, speaking generally, are liable to cause more disappointments to the patients than operations upon varicose veins, but with reasonable care these disappointments can be avoided, since when occurring they are inevitably due either to exaggeration on the part of the surgeon in the estimate of the benefits obtainable by the treatment, to want of judgment in the selection of cases, to the performance of unsuitable operations, or to the wrongful attribution of symptoms to varix which are in reality dependent upon some other condition.

With regard to the first of these reasons it must at once be admitted that, excepting certain cases of isolated cysts and local congenital masses of varix, anything like a cure in the sense in which patients usually understand the term is impossible. In general varix the utmost which can be achieved by operation may be summed up in the relief of certain discomforts, a partial diminution in the objective defect or arrest of its progress if it be increasing, the prevention of subsequent inconvenient complications, and the removal in some instances of conditions which may prove dangerous to the integrity of the limb or possibly to life—prospects assuredly sufficient to justify the operative treatment when properly applied, but not of a kind to justify the use of the word ‘cure.’

In discussing the question of operation with patients two points in particular cannot be too prominently borne in mind; the first being that if the disease has involved the saphena in the thigh, operation will not necessarily enable the use of an elastic support to be entirely dispensed with; the second is that in a case of long existing varix which has given rise to inconvenience, an operation—although it will, if the case is suitable, effect improvement and give great relief—does not necessarily place the patient in the condition of a sound person. If these points be insisted upon much disappointment will be avoided, for there is no doubt that at the present time the tendency of the public is to expect very much more perfect results from surgical operations generally than can in the majority of instances be effected by them. Operation in uncomplicated varix is to be regarded as a measure for the prevention of certain complications and as a check to the progress of the disease, and not in any sense as a cure, excepting in the local conditions which I have indicated.

From the point of view of operation, varix of the lower limbs may be divided roughly into two classes—one in which the defect is local with well-defined limits, the other in which the disease is more or less general, the long saphena being considerably implicated. There is no doubt whatever that local masses of varix, which are always congenital, occurring in

persons of active habits should be removed, especially if situated in positions liable to injury, or if there is any evidence of a direct communication with the deep main venous channels, in consequence of the danger connected with thrombosis under those

circumstances ; isolated cysts or dilatations, with the exception of those occurring in insignificant venous radicles, should be removed for the same reason.



FIG. 9.—DANGEROUS REGION OF VARIX. ABNORMALITY TYPE 8.

Two large cysts of saphena, one situated below the middle of the thigh, the other below the knee. Passing between the cysts is the large tortuous saphena. The leg is very varicose, and the saphenal valves are wanting.

to the leg operation it is useless ; sometimes it is harmful. All the benefit obtainable from treatment of general varix of the leg can be obtained by properly applied elastic support which would still be necessary in the majority of cases if an operation were performed. In cases, however, which

Cases in the second class, again, come under two denominations—one in which the disease is confined to the leg, the other in which it affects the thigh, the saphena being grossly involved. Speaking generally, if the disease is confined

are not very infrequently met with, in which in general varix there exists either a cystic dilatation of the long or short saphena about the middle of the leg, operation in active subjects is certainly indicated. The condition, however, in this class of case which most urgently calls for removal is a very tortuous and dilated thin-walled vessel passing obliquely across the shin, which is especially dangerous in footballers and other persons liable to injury in the locality concerned (fig. 12). I have known this particular vessel to be the starting-point of serious thrombosis in three cases, and extensive haemorrhage resulting from its laceration or rupture from traumatism is in my experience not very rare.

When the saphena in the thigh is involved, there being at the same time, as is practically always the case, extensive varix of the leg, the results of operation are most striking. The conditions mentioned as occurring in the 'dangerous region' can be entirely removed, all risks to the integrity of the limb or to life being thus obviated. It is, moreover, perfectly clear from my experience that the discomforts felt in the leg in general varix and the tendency of the disease to increase depend almost entirely upon the pressure of the long column of blood in the valveless saphena. In practice it will be found that if this column be sufficiently interrupted the discomforts felt below are in all cases greatly modified, and in

the majority entirely removed, the tendency to increase in the varicosity is as a rule checked, and in many cases very considerable shrinking of the varicose vessels above and below follows.

In the selection of a plan of operation the point to which I have just alluded becomes of paramount importance, for, although I know that there is room for difference of opinion in the matter, I have proved in my own practice, and have sufficiently corroborated the results of my own experience by what I have seen occurring in cases operated upon by others, that operative measures confined to the parts below the knee in general varix are useless. I have, therefore, long since abandoned them. My practice is to excise a length of the saphena extending from the point below the knee at which the two venous trunks from the leg join to a point a little above the lowest third of the thigh.¹ In no case, so far as I can recollect, has there been reason to be disappointed with the result, although in many cases the amount of varix in the leg has been enormously in excess of that in the saphena above.

On the other hand, I have seen instances in

¹ The final selection of this method, which I originally advocated about ten years ago, is the result of a careful consideration and trial of the various operations which have up to the present time been suggested (including the treatment by avulsion and also by the removal of large areas of skin and subcutaneous tissues), none of which have in my hands effected anything approaching the good results produced by the plan here recommended.

which thirty or more small pieces of vein have been removed from the leg in cases of this kind without any benefit whatever resulting until the saphena in the thigh has been dealt with. Indeed, in two cases

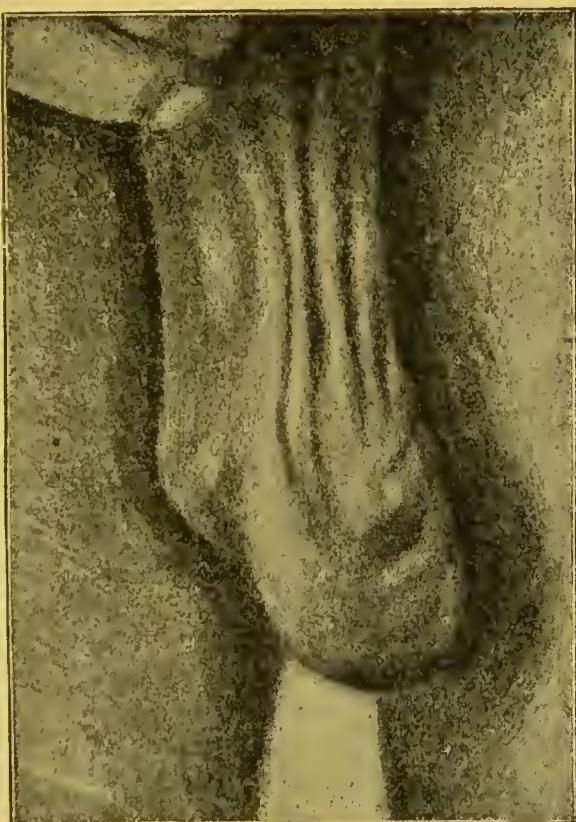


FIG. 10.—THE SPONTANEOUS CURE OF VARIX.

A varicocele which entirely disappeared after the receipt of an injury which produced thrombosis.

which have come under my observation after having been operated upon in this way the subsequent state has been far worse than the condition before the treatment. The operation which I recommend occupies a comparatively short time in its performance,

the wound is in a part which heals quickly, and the difficulty sometimes met with in keeping a large number of small wounds aseptic does not, of course, arise. I have a vivid recollection of a varicose limb in which not less than fifty short pieces of vein had been excised, the operation, it was stated, having occupied two hours; the limb when I saw it, three months after the operation, was œdematous, some of the scars were hypersensitive and irritable, whilst between some of them were thrombosed veins; the thrombi, it is true, were comparatively harmless as they were quite isolated, but they were distinctly antagonistic to rapid progress.

It is, I presume, needless to say that operation in varix the result of thrombosis so long as the dilated veins are concerned in carrying on the collateral circulation is unjustifiable — hence no operation should be performed in such cases if there is œdema, or if the limb is manifestly increased in size generally. If, however, in cases of varix due to thrombosis there is no sign of œdema, and the limb is not appreciably larger than that on the opposite side, they may be dealt with as ordinary cases of uncomplicated varix.

In those who are the subjects of extensive varicosity of the lower limb whose occupation or amusements are such as to throw great or sudden strain upon the abnormal vessels, resection of a portion of the saphena in the manner which I have mentioned

is strongly indicated if any feeling of tension in the vessels is perceptible to the person concerned during great exertion, although at other times no trouble or discomfort of any kind may be experienced. Failing operation in such cases, an elastic support extending only to the upper end of the leg should be worn during the continuance of the conditions leading to the liability to strain.

At first sight it would seem almost impossible to attribute to varix symptoms caused by some other condition, but in practice this is not altogether difficult. I have myself, somewhat against my will, it is true, operated upon a case in which symptoms ascribed to varix were undoubtedly in no way connected with it. The case has already been recorded,¹ but it affords such an excellent clinical illustration that I repeat its salient points.

The patient was a man engaged in an active occupation, to whom, therefore, the ability to take a large amount of exercise was a necessity. He consulted me on account of general varix of both lower limbs, and he described symptoms which might with reason have been thought due to the condition of the veins. His principal complaint was a feeling of fatigue and general fulness of the limbs at the latter part of the day; sometimes he suffered from cramp, and he described a puffiness about the ankles which was stated to occur after more than ordinary exercise. The symptoms are, I need hardly say, similar to those very commonly described in varix. In this

¹ *Clinical Journal*, January 19, 1898.

particular case, however, I could not satisfy myself that the abnormal veins were the cause of the trouble. I therefore advised him against operation. A few weeks later he returned, having assured himself that the whole of his trouble was connected with the condition of the veins ; he consequently asked me to operate. I stated I was still averse to the operation, and that I must not be blamed if no material good followed the treatment. The operation was subsequently performed with considerable benefit so far as the varix was concerned, but the symptoms complained of were not affected in any way so far as I could judge. A year later the patient was seen again. The symptoms had increased, and it was clear that they were due to an obscure nervous degeneration which was presumably incurable.

THE DEVELOPMENT OF VARIX SUBSEQUENT TO OPERATION

Exception is sometimes taken to the operative treatment of varix, because after the removal of the veins concerned other vessels to supply their places may appear, a recurrence of the varicosity, in fact, being thus liable to occur. Recurrence in the true sense is usually the result of inadequate operations ; the removal, for example, in general varix of small portions of veins in the leg whilst the saphena in the thigh is left intact.

After a complete operation a few new developments of varix may follow, especially in advanced cases, but they afford no valid objection to the opera-

tion, as they rarely give rise to trouble or inconvenience and in no sense diminish the benefit derived from the radical treatment when properly applied, excepting perhaps from an æsthetic point of view. The following is an illustrative case :

A man thirty years of age was the subject of extensive varix on the inner side of the left knee which, by reason of its sensitiveness and steady increase, rendered riding impossible. The varix was removed in the usual way, riding and rough exercise, which were previously out of the question, being subsequently resumed with perfect comfort. Three years later a tortuous vein on the outer side of the knee and thigh was noticed, which was connected with some dilated vessels at the inner side of the leg. After growing to a certain size this vein became stationary, and has never caused any sort of trouble.

Here undoubtedly a new development of varix occurred after operation, either as a coincidence or as a result of the treatment. It would, however, be manifestly unreasonable to raise an objection on that account to an operation which had completely attained the end which was aimed at in its performance.

THE OPERATIVE TREATMENT OF THROMBOSIS IN VARIX

I have already indicated the local conditions which tend to the formation of thrombus in varix, and have also shown how by the removal of certain abnormalities all risk of the complication may be

avoided. I now come to in some respects the most important matter to which I wish to call attention—viz. the operative treatment of thrombosis in varix. Having regard to what has been said of the tendency



FIG. 11.—THE SPONTANEOUS CURE OF VARIX.

A varicocele one year after the receipt of an injury which caused thrombosis
the condelia before the injury was exactly like that shown in fig. 10.

of thrombus in varicose and valveless veins to travel rapidly and invade the main deep veins, there can be no doubt that in the vast majority of cases the interest of the patient is best consulted by the removal at once, if practicable, of the thrombosed

Erratum.

Page 46, in description of Fig. 11 *for condelia read condition*

vessel with the whole of its contained clot; in cysts and in local masses of varix in which there is reason to suspect gross direct communication with the deep veins this treatment is peculiarly appropriate. Not only does the extirpation of the thrombosed vessel remove the liability of the deep veins to become involved and ensure a speedy recovery, the convalescence being represented by the time occupied by the healing of the operation wound instead of the tedious delay of weeks or even months involved in the orthodox treatment by rest, but it also prevents recurrence of the thrombosis, a matter of no small importance, seeing that in the majority of cases in which thrombus has once formed recurrence happens, sometimes frequently, each recurrence involving the same risks to the integrity of the limb, or perhaps to life, which were associated with the original attack. Moreover, it is undeniable that in those cases in which recurrence occurs crippling of the limb, if nothing worse, finally ensues, for although it may be true that actual lameness need not follow, so much care has to be taken in the ordinary use of the limb to guard against further thrombosis that it can hardly in the true sense be considered sound.

Complete removal of the thrombosed vein in some instances may not be desirable, the portion of the vessel concerned being, for example, so long that the operation requisite for its removal may be under

certain circumstances considered too severe. The main object of the surgeon should then be to prevent the extension of the thrombus to the great deep veins of the part. In the lower limb this access to the deep vessels in varix is usually through the large valveless saphena.

Writing ten years ago, I strongly advocated in creeping thrombus of the saphena the placing of a ligature around the vessel on the proximal side of the clot with a view to arresting its progress. At the time of making this suggestion no opportunity for carrying it out had offered itself, but I have since practised the method (modified to the extent of dividing the vessel between two ligatures) in several cases, in none of which has the thrombus extended beyond the point of ligature, although in each case it rapidly reached the point of artificial occlusion. It is not, I think, unreasonable, seeing the rapid extension of the clot to the point of ligature, to conclude that the integrity of the limb, and possibly life, in these cases was saved by the energetic treatment which was carried out. After ligature thus applied the portion of the vessel thrombosed may be subsequently removed at a convenient time if necessary.

If there is any evidence of the existence of a direct communication between the varix and the deep veins, excision when possible of the part affected, and not ligature of the saphena, is obviously indicated.

THE SURGICAL TREATMENT OF EMBOLISM IN VARIX

A certain number of cases of thrombosis in varix lead to embolism, resulting in sudden death or in pulmonary lesions of more or less gravity. In the former case the surgeon, of course, is powerless, but in the latter condition, when there is a tendency, as is not infrequently the case, to repeated detachments of emboli, I have sufficient proof to show that incalculable good can be done by surgical means provided that action is taken speedily and boldly.

As the result of practical experience I have come to the belief that when embolism has followed upon thrombosis in any of the conditions referred to as existing in the ‘dangerous region of varix’ it is the duty of the surgeon at once either to remove the source from which the emboli are derived or to interrupt by ligature if possible the channel by which



FIG. 12.—VARIX OF LEG AND
AT INNER SIDE OF KNEE.

Showing oblique varicose vein crossing the shin—the most dangerously placed vessel met with in varix of the leg (see page 39).

they reach the central parts. It is at once clear that such treatment must, if it is to be successful, be in the majority of cases carried out before the thrombus has invaded the deep veins. With reference to this point it is interesting to note that if embolism does follow thrombosis in varix it almost always, so far as I have seen, occurs either before or at the moment of the invasion of the deep vessels by the clot. The implication of the deep vessels, if it has already taken place at the time of the detachment of the embolus, does not negative the possibility of good from the radical treatment which I recommend if the original seat of the thrombus has more than one communication with the deep channels. For example, a cyst of the saphena in the dangerous region which has become thrombosed may have a direct communication with the deep vessels which has given rise to their rapid implication, whilst the saphena itself may be free and be the channel by which thrombus or embolism is conducted to the central parts. In such a case removal of the original seat of thrombosis is rationally indicated, especially if the thrombus is showing signs of softening, the period of softening of course being the time at which the tendency to embolism is the greatest. The following will serve as a good clinical illustration of the benefit derivable from operations under the circumstances just indicated.

I was consulted by a tall, heavy subject, about forty-three years of age, with reference to varix of the left lower limb. The whole limb was affected; the long saphena was very large, and just above the level of the knee it was involved in a cystic dilatation of about the size of a walnut. The main object of the consultation was to ascertain whether the condition of the veins was any bar to cycling, very little other exercise being taken. I strongly urged the removal of the cyst with the neighbouring part of the saphena, because, although I could not of course say with certainty that trouble would arise from it, I thought it very probable that such would be the case. My opinion was considerably influenced by the fact that the cyst was in the situation in which a direct communication between the varix and the deep veins sometimes exists. Although the patient himself was inclined to submit to operation, the adverse counsels of others prevailed, and I saw nothing further of him until about twelve months afterwards, when I received a summons from the country asking me to meet him at his house as he was in trouble. Upon seeing him I found the large saphenous cyst packed with clot, the result, he declared, of a slight strain which he distinctly felt whilst cycling. There were acute local pain and redness, with a high temperature (102°). The patient was extremely sensitive and nervous, and although I felt that immediate operation was indicated, seeing the very large size of the saphena, it was deferred for reasons at the time sufficient. A week later the thrombus passed a short distance up the saphena, and then remained stationary for another week. At this time without any increase in the thrombus in the saphena a very severe attack of sudden cardiac pain followed by acute dyspnoea occurred; two other very slight attacks succeeded rapidly and three days later

an attack of cardiac pain and dyspnœa which nearly proved fatal suddenly supervened. After each of these attacks the local signs of pulmonary lesion from embolic infarct were present. The patient was by this time desperately ill, and it seemed quite clear that if another embolus became detached the case must terminate fatally. I therefore, with the concurrence of a distinguished physician, removed the thrombosed portion of the saphena and cyst. An immediate improvement followed the operation, no further embolism occurred, and a steady although slow convalescence succeeded in spite of some indication of thrombosis of the deep veins which was just beginning to show itself at the time of the operation. The parts after removal showed that the saphena was quite free from thrombus at a point about two inches above the cyst, being packed with firm, healthy clot up to that level. The cyst was full of clot, which towards its inner side was softening. This softened clot, which to the naked eye was indistinguishable from pus, extended down a branch of considerable size, which, leaving the cyst wall, passed deeply into the limb, extending, so far as could be judged from its length and direction, in the upper part of the popliteal or the commencement of the femoral vein.

It can hardly be denied that this is a very striking case. I suppose there is little room for doubting that the emboli which nearly killed the patient were derived from the softened clot extending along the branch passing directly to the deep vessels. Taking all the circumstances of the case into consideration, it is, I submit, perfectly reasonable to assume that

the removal of the parts concerned saved the patient's life. I have had experience of other similar cases in which the detachment of emboli ceased after operations of the kind now described.

It must not be understood that I wish to recommend operation in all cases of thrombosis in varix, since every case must of necessity be judged according to its merits, but speaking generally the principle is, in my opinion, sound, and the treatment is one which should always be carefully considered in cases of the kind.

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